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INTEGRATION OF INFORMATION FOR HOSPITAL RATE SETTING

VOLUME 5: THE USES OF POPULATION-BASED DATA FOR
RATE SETTING

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INTEGRATION OF INFORMATION FOR HOSPITAL RATE SETTING

VOLUME 5: THE USES OF POPULATION-BASED DATA FOR RATE SETTING

by

Jennifer Robbins

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PREFACE

Since the early 1970's, an increasing number of state governments and Blue Cross plans have been looking to hospital rate setting as a possible means to moderate the every mounting increases in costs of hospital care that have been driving up taxes and subscriber premiums. Although the concept of hospital rate setting has gained wide acceptance as a cost containment measure, there is little agreement so far on means of implementation that will be equitable both to the hospitals that provide the service and to the public that pays the bills.

This is one of a series of working papers from a project that focuses on ways to improve the nature of information available for decision-making in setting hospital rates. Several of these papers describe in detail the types of information currently being used by rate setting programs; others deal with various technical or organizational obstacles that presently block access to the information that such programs want.

Here, the author looks at the question of information for hospital rate setting from an entirely different perspective. She suggests that if truly significant savings are to be made, rate setters must broaden their sights to obtain certain entirely new types of information. She asks them to complement their customary measures of hospital service efficiency at the micro--cost center--level with comparative analyses at the macro level, to show the nature of variations in per capita hospital expenditures and use of hospitals among populations living in different subareas of their states and regions.

The paper illustrates some of the startling discrepancies that can be revealed by such analyses. For example, a fifteen-fold difference was discovered in tonsillectomy days per capita between populations living in two different areas of Vermont. Such differences reflect different physician customs of patient management, and are reflected in correspondingly startling differences in rates of per capita expenditure for hospitalization.

The author is careful to point out that, when faced with such discrepancies, rate setters are in no way qualified to make normative judgments of what might constitute the most appropriate level of per capita hospital utilization and expenditure. Clearly, physicians and epidemiologists must assume the sole responsibility for reviewing the evidence on patient outcome that is required to construct norms of acceptable professional practice. However, she maintains that if hospital rate setting is to be an instrument for improving the cost effectiveness of the health dollar, and for improving the allocation of new dollars for hospital expansions, rate setters have the responsibility for making population based data analyses that raise the questions that these professionals must be asked to answer. In short, the paper suggests that we cannot deal with reviews of hospital utilization and quality of patient care as processes separable from reviews of the manpower, facilities, equipment and, thus, the dollars spent in delivering that care.

The author is uniquely qualified to discuss the integration of hospital service and utilization data in applications of population based data analyses since she was assistant director of the Cooperative Health Information Center of Vermont, Inc., one of the nation's few operating health statistical centers.

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INTRODUCTION

Cost control in the health care industry has been an elusive objective of American policy at federal and state levels for at least a decade. In some states, rate setting has been looked upon with favor as a way to achieve that end. Rate setting focuses on correcting the inefficiencies of health care institutions, whose poor management has been widely blamed for at least part of the extraordinary financial burden communities bear for health care. Rate setters have looked for ways to cut costs in hospitals by examining data generated through routine administrative and accounting efforts of these facilities. Policies have been devised to create incentives for more efficiency, upgrading the the skills and practices of an industry plagued by the low priority it has assigned to administration.

Although there can be no doubt that efficiency was (and is) an issue in health care costs, the results of improving it have not brought about cost reductions of the magnitude desired. Despite the best efforts of rate setters and others, costs continue to rise at a pace and to levels that outstretch predictions and other sectors of the economy with alarming regularity. Why is this so?

Part of the answer may lie in the limits of the rate setter's jurisdiction--in only a few states are all third party payors included, for example. But a more basic explanation can be found in the fact that control over key decisions affecting costs in the health care industry have eluded the rate setting process altogether. They have been left both explicitly and implicitly to physicians. Administrators, third party payors and the public through its legislative and fiscal representatives, have avoided tinkering with what have been broadly classified as "matters of clinical judgment."

Sidestepping clinical judgment has produced results of varied economic and social value. Cutting costs by reducing Medicare and Medicaid

benefits produces more dramatic results than reducing inefficiency. But it discriminates against those people who are least able to pay for care. It is, or should be, the least desirable course of action, the last resort.

A more equitable approach to cost control has been initiated in a few states where rate setting has joined forces with planning authorities to regulate the growth of the medical care industry, curbing unnecessary expansion of the system through public policies and criteria for justifiable additions to the resources of the industry. But these and other methods geared to achieving the lowest possible unit cost, the greatest efficiency and the least disruption to the provider's patterns of service delivery have not succeeded in curbing the escalation of hospital costs.

Is there another method that could be more effective? Could rate setting do better by moving into unknown territory and by questioning clinical judgments? Like medical care planning and regulation, rate setting has tacitly assumed that the health delivery system's results--the medical care received--were beneficial or effective. Rate setting has had neither the incentives nor the tools to challenge the tradition that assumes "Doctor knows best". That tradition can no longer be left unchallenged by public agencies.

The evidence is now mounting to show that "clinical judgment" is not a scientific, unified or consistent phenomenon. Congressional and journalistic inquiries¹ have echoed the results of a growing body of research establishing the fact that doctors differ widely as to what constitutes appropriate or effective care. Rate setters need a systematic way to incorporate this evidence in their deliberations and decisions. Without it, they may be unwittingly sustaining and promoting the delivery of inappropriate, unnecessary or even harmful services. In short, they may fail to bring about the most useful and far reaching cost reductions.

Rate setters are charged with regulating the expenditure of a sizeable portion of a community's financial resources, or income. Surely, they must ask whether the costs are being incurred in a way that promotes health. And cost control or reduction can be achieved by producing as few

units of service as are needed to achieve health for a population. Reduction of cost through greater efficiency--a lower cost for each unit of service--is desirable, but it can only marginally affect expenditures. It is not at all clear that health care institutions with the lowest unit cost have the lowest total expenditures, or that those with the highest total expenditures produce the healthiest population.

The question is, how can rate setters use evidence of these problems to reduce costs and improve the quality of care? Rate setters are not qualified to evaluate medical care, nor should they be. But they can and should have the data in hand that would enable them to ask the right questions of those who are so qualified. Such data now exist in a few states, and in the very near future may be ubiquitous. (Health care planners will be required, under the National Health Planning and Resource Development Act, to use these data, and there is some evidence of a willingness to commit the necessary resources at the federal level to make such a requirement feasible.) This paper argues that rate setters can vastly increase their impact on the cost of health care by expanding their data base to include information about the population receiving services, the utilization of those services, and the results of those services.

To begin with, the paper describes the rationale for the population based approach, reviews some of the results this approach has produced so far, and compares the new data to more traditional statistics. The kinds of problems in medical care delivery raised by population based data analyses are discussed, drawing from the experience of three existing population based data systems. The kinds of data such a system requires are outlined, including some comments concerning their availability and reliability. Finally, some of the issues regarding management of a data base will be spelled out, including the necessary institutional or bureaucratic relationships around the data base.

I. WHY POPULATION BASED DATA?

Before delving into the issues exposed by population based utilization data, a brief definition of the term may assist those unfamiliar with the methodology of epidemiologists. In Maine, Rhode Island and Vermont, pre-existing information systems are the cornerstones of new population based data systems. Two sets of information are needed: utilization data and demographic data; population based data systems link these two. Using hospital discharge abstracts, services to each patient are recorded and tabulated so that each one can be assigned to the population of the geographic area from which the patient came. Alternately, an enrollment group, such as all persons enrolled in the Medicare program, can also be the reference population. Later, when the aggregate number of services to patients in the population is divided by the total numbers of people in that population, a utilization rate is generated that can be compared to utilization rates in similar populations. Most simply put, population based data looks at the utilization of health care from the perspective of the people being served rather than from the perspective of the institution delivering service. It asks, for example, the rate at which different communities or regions have received appendectomies, and seeks to learn whether the communities with a high appendectomy rate are getting more, or less, effective and appropriate care than the communities with the lower rates. Generally speaking, the population based data mechanism is most useful as a way to flag exceptions, draw comparisons, or identify trends. It is a tool for asking questions more often than it is a tool for providing answers, but the questions it raises are powerful.

In Vermont, for example, data show that women in one area of the state experienced twice as many hysterectomies as did women in another; the range was between 30 and 60 cases per 10,000 women per year. Cholecystectomy ranged between 18 and 53 cases per year per 10,000 women. Appendectomy varied from 14 to 31 cases per 10,000. Translating these kinds of data into the number of hospital days per 10,000 population shows that appendectomy days vary in Vermont from 74 to 188, hysterectomy days from 284 to 670 days.²

Who is better off? Does the area with a low surgical procedure rate have people who are sicker or suffer more? Are the people in the high rate areas losing organs unnecessarily? Rate setters are in no way qualified to answer such questions on a case by case basis, but the data make it imperative that epidemiologists and clinicians do seek answers. Certainly if the high rates are directly associated with excess morbidity or mortality, the reasons for such findings should be thoroughly researched. Licensing, planning and reimbursing bodies can influence the growth and distribution of facilities to make suitable corrections. The human and financial stakes are high enough so that the data must be available to pose these and other questions.

To look at the issue from another vantage point, the tonsillectomy rate may be examined in terms of the number of hospital days per population. Such rates are a function of cumulative physician decisions, first to admit such patients, and then to decide how long such patients should remain in the hospital. In the three year period 1969-71, the tonsillectomy day rates in different hospital service areas in Vermont ranged between 19 and 289 days per 10,000 persons, age adjusted. In other words, there was a greater than fifteen fold variation in days spent in the hospital for a tonsillectomy. Length of stay, on the other hand, varied just two fold, from 1.2 to 2.4 days. Reductions in length of stay could not produce the same magnitude of savings as reductions in the number of operations performed.

Estimates were made of the cost variations for this single procedure--still the most common cause of hospitalization for children, and the most frequently performed surgery in the United States. As Table 3 shows, the area in Vermont with the lowest tonsillectomy rate experienced an annual per capita cost of sixty-three cents; the highest area was a whopping \$5.69 per capita. If every community in the state had received tonsillectomies at the lower rate during the study period the total annual cost would have been \$337,050. At the higher rate the cost to Vermont people would have been over three million dollars (\$3,044,150).

Table 1.

Estimated Dollars Expended on Tonsillectomies and Adenoidectomies (T&A's)
For Persons Under 26 Years of Age in 13 Hospital Service Areas
in Vermont, 1969-71

Area	Number of Persons under 26 (1000s)	Number of T & As	Total Dollars Expended (x1000)	Mean Cost Per Case	Dollars Per Capita
Total	535	5315	\$ 1038	\$ 195	\$ 1.94
1	16	218	46	212	2.92
2	26	130	26	198	.98
3	10	141	31	220	3.02
4	22	262	55	210	2.51
5	32	351	73	205	2.28
6	48	429	78	183	1.65
7	16	446	90	203	5.69
8	29	253	49	195	1.72
9	21	306	67	219	3.14
10	68	692	144	208	2.11
11	71	888	181	204	2.55
12	162	1146	189	164	1.16
13	14	53	9	167	.63

SOURCE: Vermont Surgery Study, CHICV, 1974, p. 28 (see footnote 2).

At that higher rate, it is possible that over two and a half million dollars (or 1% of Vermonts' medical industry product) could have been spent unnecessarily for this single procedure alone.*

Obviously, before mandating that all Vermonters receive tonsillectomies at a rate not to exceed the lowest experience, one needs evidence to establish that there is not unattended morbidity in the areas with the lower rates. Rate setters cannot evaluate that morbidity, but they can certainly, on the basis of the potential cost savings alone, use these data to create pressure, incentives, or demands on the system that such evaluations be made. With appropriate linkages to peer review organizations or others charged with overseeing the quality of care delivered, rate setters can exert a significant influence on the cost and value of health services.

Without population based data, the rate setter's leverage on the medical care system is much weaker. Institutional indicators of performance simply do not explain the variations in utilization or cost experienced by differing populations. Using data from Maine, Wennberg has compared population-based and institutional indicators of hospital services. As Table 2 indicates, conventional measures of hospital efficiency, such as average length of stay, percent of occupancy and bed turnover rate suggest only modest differences between Area IV and Area V. But comparisons of population based patient days of care show that utilization in Area IV is nearly double that of Area V, with a per capita expenditure rate nearly 34% higher. Wennberg, in reporting these results,³ notes that Area IV has a high rate of elective surgical procedures, particularly tonsillectomy and hemorrhoidectomy.

Where does this leave the rate setter? It leaves him with a group of questions about necessary or unnecessary surgery. It leaves him with

* The actual annual cost of tonsillectomies in Vermont during the study period was \$1,039,900.

Table 2.

PROFILE OF INDICATORS OF PERFORMANCE IN FIVE LARGEST MAINE HOSPITAL SERVICE AREAS, SHOWING INCIDENCE OF HOSPITALIZATION, PER CAPITA EXPENDITURES, PER CAPITA USE AND AVAILABILITY OF BEDS AND THE STATUS OF THREE INSTITUTIONAL INDICATORS

	POPULATION DATA				INSTITUTIONAL INDICATORS		
	Incidence of Hospitalization°	Patient Days° of Care	Available Beds°	Per Capita Expenditures°	Percent of Occupancy†	Average Length Stay°	Bed Turnover† Rate
Area I	145	1,104	4.1	102	73	7.6	33
Area II	153	1,244	5.0	92	73	8.1	31
Area III	157	1,054	4.2	75	65	6.7	34
Area IV	235	1,625	5.7	109	72	7.0	39
Area V	127	831	3.8	72	72	6.9	32

°For 1973 population rate per 1,000 population: incidence rate is age-adjusted.

† For 1971

Bed Turnover Rate is defined as average number of admission per available bed.

Source: Wennberg, et al., "Health Care Delivery in Maine III: Evaluating the Level of Hospital Performance", Journal of the Maine Medical Association, 1975, 66, 11: 304

some disturbing evidence that may need analysis by epidemiologists and by peer review groups, such as PSRO. But it also leaves him with the potential to cut costs (or at least to refuse to allow them to increase) equitably and substantially.

Wennberg has also compiled evidence to show the paradoxical nature of past regulatory and planning decisions that are based on the traditional indicators such as percent occupancy or length of stay. Using permission to expand as a reward to institutions with lower lengths of stay and higher bed occupancy rates--institutional criteria of need--the regulatory decisions affecting new facilities and price control exceptions under Phase II of the Economic Stabilization Act encouraged increased volume in areas already experiencing high utilization. Per capita hospital costs were high in the area with high utilization, and yet based on institutional indicators alone, the Price Commission awarded that area's hospital a price increase, denying it to the institution whose service area ranked twelfth out of thirteen in annual per capita hospital expenditures.³

In sum, population based data offers a valuable tool for examining and possibly controlling costs in the health care industry. By examining utilization from the perspective of the population at risk, rate setters can begin to evaluate the productivity of the medical care system. The rate setter does not need to challenge individual decisions by individual practitioners, but when examination of the cumulative choices of many reveals the absence of agreement about what is effective, the rate setter can demand an explanation or a correction. As a stimulus for research the rate setter can begin to set target dates beyond which reimbursement policies will no longer reward areas of high utilization of certain index procedures without evidence that such higher utilization brings attendant benefits.

II. ESTABLISHING WHAT IS APPROPRIATE

The task of determining what is appropriate or effective medical care is enormous. It cannot be accomplished quickly or easily, nor can it be done with equal ease for all medical or surgical therapies. Priorities will have to be set in terms of the impact and feasibility of such research. Rate setters convinced of the need to get into the issues surrounding appropriateness will find themselves in troubled waters: the evidence is not nearly as comprehensive or clear cut as one would wish. The major problem, as Rutstein points out, is "the almost insurmountable difficulty of establishing objective criteria for the measurement of increasing gradations of positive health."⁴

A number of studies, including Rutstein's, are in progress to establish such criteria; the need to do so has been widely recognized, and there are indications of renewed commitment from the Federal Government to support clinical research that will produce the evidence regulators will need. In the meantime, rate setters can improve their control of costs by beginning to move from policies and procedures that assume that all outcomes are effective to a system that asks for evidence of effectiveness.

In Vermont, for example, the State Insurance Commissioner, when presented with data describing surgical variations in the state, requested that New Hampshire-Vermont Blue Cross/Blue Shield investigate the feasibility of a "second opinion" program. Under this program, payment for selected operations is allowable only after two physicians agreed that the surgery was necessary. In New York City, a similar program had reduced the rate of surgery for one population by 30.4%, for another by 17.6%.⁵ The savings amounted to over a half million dollars for the two groups (1356 persons). A Congressional Subcommittee has recommended that the second opinion program be instituted for all Medicare and Medicaid patients, conservatively estimating savings at 3.9 billion dollars-- and 11,900 lives.⁶

One factor that researchers agree directly influences the amount and rate of surgery done is the number of surgeons, operating suites, and beds available for patients. Lewis found that surgical rates in Kansas varied according to the supply of facilities and personnel committed to performing surgery.⁷ In Vermont, this finding was confirmed and a corollary observation made: "By contrast, a higher supply of physicians who do not perform surgery, particularly internists, tends to be associated with lower surgery rates."⁸

Insurance coverage and the way doctors are paid also play a significant role in the amount of surgery and other medical care provided. People enrolled in prepaid group health insurance plans had half as many operations, and were hospitalized a third as often as people with conventional insurance coverage who obtained care from the fee-for-service system.⁹

What all these findings mean to the rate setter is that there are dollars to be saved, expenditures to be eliminated and improvements in health to be achieved by development of a way to (1) systematically review the experience of populations at risk or receiving services; and (2) ask for some answers from the medical profession, the hospitals and the third party payors about true need--in terms of the population, not the provider--for the service or benefit under review. The answers are not all going to be available, but once there are incentives and pressures to produce them, the work to find answers will undoubtedly accelerate.

The mere existence of the data to establish the variations in care can serve as a powerful tool for cost reduction through changes in practice patterns. Feedback of data of this variety to the proper agency or group can sometimes do the trick. In Vermont, tonsillectomy rates in one hospital service area dropped from the state's highest to the state's lowest in one year--as a result of exposure to the data and the subsequent introduction by the hospital of more stringent criteria for performing the operation.

Vayda, reporting on the use of population based surgical data in Canada, cited an example of reduction in rates of hysterectomy in Saskatchewan.¹⁰ Between 1964 and 1971, the rate for the province had climbed 75%. When this evidence was brought to the attention of the provincial College of Physicians and Surgeons, the College was able to develop criteria for the procedure, and ultimately to bring about a reduction for the whole province of 13% in one year. (More strikingly, the College reported a 50% reduction in the city with the highest rate of "unjustified" hysterectomies.) The savings from such a change must be considerable, to say nothing of the reduction in unnecessary discomfort or morbidity. The example further points to the need to make the data available to those charged directly with responsibility for the quality of care, in this case the doctors' professional association. Such linkages are a vital ingredient in the process through which data can be used to improve both the efficiency and the quality of medical care.

Rate setters, health planners and policy makers, and to a lesser extent perhaps the general public, have all been made aware of still another highly significant cost factor in health care: the use of the most expensive facility, the acute care, short stay hospital, is not always appropriate. Less costly alternatives, such as self-care units, homemaker or visiting nurse services, or other forms of ambulatory care need the fiscal stimulus the nation gave to hospitals several decades ago (through the Hill-Burton program, among others) so that they can indeed be used as substitutes to hospitalization. A vigorous effort to shift third party coverage to include non-hospital based services would undoubtedly be resisted by hospital interests, but the savings to be realized for communities at large--to say nothing of the potential reduction in iatrogenic illness--should be sufficient encouragement to move in this direction.

III. INGREDIENTS OF A POPULATION BASED DATA SYSTEM

What then exactly are the data that rate setters should use to establish effective cost regulation? Are they generally available? Are they reliable? How valid are they? Can they be easily understood, unambiguously interpreted, exposed to public scrutiny? The experience in the three states with operating population based health statistics systems is still relatively new, but some of the answers are emerging. In this section, the types of data available (and those still missing) are briefly outlined, followed by a discussion of some of the issues surrounding the management and use of health statistics.

Several types of data are essential for the analyses of the relationship between health and medical care, such as the data which describe: the population of the hospital service area; services received by this population; the resources of the medical care system; their utilization; their expenditures; and the outcomes or results of care. See Exhibit I.

Demographic Data

These are the essential denominators for a population based data system. In addition to the basic information about the size and location of the population (its organization into census tracts, towns, cities, counties, etc.), this group of data includes descriptions of the age, sex, and socio-economic status (as measured by education, or, where possible, income). Rhode Island has the advantage of being totally census tracted--enabling that state's data base (SEARCH) to correlate medical care data with all indicators collected through the U.S. Census. In Maine and Vermont, the town or zip code is used, with more limited census data.

With the decennial census the general population data becomes more difficult to extrapolate by the end of each decade. In some areas, the state census, and/or secondary sources (e.g., school classes) may be used to

Exhibit I.

Summary of the Elements of a Population Based Data System

I. DEMOGRAPHIC DATA

Uses: Denominator for utilization rates
Standardization and comparison
Socio-economic descriptions
Growth trends and projections

Types or

Sources: U.S. Census; State or regional population projections;
Vital data (births and deaths); school census.

II. RESOURCE DATA

Uses: Description of providers or producers of services

Types or

Sources: Manpower--Physicians by specialty, location, type of
practice; other health manpower

Facilities--Hospitals, chronic care, home health agencies,
special care institutions

Hospital Services--Scope of special services

III. UTILIZATION DATA

Uses: Description of product or output of system

Types or

Sources: Hospital Services	Discharge Abstracts
Ambulatory Services	Claim Forms
Nursing Home Services	Billing Systems
Home Health Services	

IV. EXPENDITURE DATA

Uses: Estimation of cost by service and population

Types or

Sources: Hospital budgets; insurance reimbursement rates and amounts;
sources of funds (public and private)

V. OUTCOME OR HEALTH STATUS DATA

Uses: Evaluation of Effects of Care

Types or

Sources: Mortality rates by age, sex, cause of death
Morbidity rates--days lost from work, incidence and prevalence
of reportable diseases

supplement census year counts.

More general data, such as the urban-rural mix of the population, and its mobility, are also helpful. Major subdivisions of the population by race, religion or ethnic group may be relevant as well.

Vital Statistics

The records of births and deaths are an essential part of Maine, Vermont and Rhode Island's data systems. Birth and death rates contribute to the growth rate of communities, suggesting especially changes in the age structure of the population under review. In addition, death rates can be used to develop case fatality rates for specific diseases, surgical procedures, and/or segments of the population. However, the reliability of the "cause of death" entry has been variable, and can only be used as an estimate of problems. Detailed reviews of case records may be necessary to determine whether or not these entries are consistent or reliable.

Data on Resources

Traditional measures of the resources of the medical care system--beds, physicians, and the like--are basic to any health statistics operation, but they are far more useful when described in great detail by specialty, and then linked to utilization. Physician counts, for example, are especially poor predictors of use unless they are available by specialty, and by type of practice. In Maine, Rhode Island and Vermont, data are available from published sources and state licensure authorities to identify and describe licensed personnel practicing in each state--and this kind of data is relatively ubiquitous. For the rate setter, such data can shed critical light on the changing patterns of medical care in a community. Surgeons practice surgery, pediatricians see children, gynecologists operate on women, general practitioners hospitalize their patients less frequently than internists, and so on. Obvious statements, but often overlooked

when evaluating the "need" for a new surgical suite, and increase in use of coronary care units, and the like.

In Vermont, linkages between data on physician specialty and utilization patterns revealed for example, that 10 doctors accounted for more than half of all the tonsillectomies in the state.¹¹

In short, "need" is a function of the provider's resources and choices as well as a reflection of the presence or absence of disease or discomfort in the population.

Facilities

Hospital and other health facility resources are somewhat easier to describe. They can be classified by function, and detailed descriptions of their resources are generally available. What are not generally available, but critical to the rate setter trying to understand how a facility operates in the total health care system, are data linking the facility to the population it serves. Hospital service areas can be obtained from patient discharge abstracts or from special patient origin studies, described below. It is these population based facility data that make the Maine, Rhode Island and Vermont data systems unique and powerful.

Resource data on facilities should, of course, include not only hospitals, but nursing home, chronic care, homes for the aged, specialized institutions (such as a burn center), and to the maximum feasible extent, ambulatory care facilities such as home health agencies, large group practices, and the like. With the advent of national health insurance, record linkages between each of the facilities in a health care system will be feasible. Until then, special studies will be needed to "track" the flow of patients or dollars from one to the other. Individual record abstracts sometimes indicate the site to which a patient has been discharged--i.e., home, nursing care facility, etc.--but connections between two or more facilities cannot be made accurately without unique patient

identifiers, such as a name or Social Security Number. Before unique identifiers are used a strong case for the utility of such an invasion of privacy would have to be put forward.

Utilization Data

The simple addition of the patient's residence on a hospital discharge abstract form makes the essential connection between the service and the population. In Vermont, abstract data comes from the PAS system of the Commission on Hospital and Professional Activities in Ann Arbor, Michigan, a private system to which all but one of Vermont's general hospitals subscribe. Abstracts from the hospital not on PAS are collected manually by staff from the Vermont health statistics center, the Cooperative Health Information Center of Vermont (CHIC). Rhode Island's SEARCH obtains data through a Uniform Hospital Discharge Abstract supplemented with PAS data. In Maine, two pre-existing information systems, PAS and the Blue Cross Data System, cover all hospitals in the state; these are merged to form a single file. These data cover virtually all hospitalizations in short-stay general hospitals of residents of these three states. Vermont data are available as far back as 1969; in Maine and Rhode Island, they extend to 1972.

One way to analyze the relationship between the services and the population is to map the market or service areas of every hospital based on the information in the hospital record abstract. Once patient records have been classified by hospital and town of residence the towns are assigned to the hospital used by a plurality of residents. Thus, if sixty percent of hospital admissions for the residents of Waterbury were to Central Vermont Hospital, the town of Waterbury is assigned to the CVH service area. The population of each hospital's service area thus becomes the denominator upon which rates are calculated. (This may sound like a minor bit of methodology, but hospital administrators have quickly caught

the significance of the size of their population base, and watch closely to see that they are assigned towns accurately. One way to lower a rate is to raise the denominator!)

Hospital discharge abstracts, like other large, complex record keeping systems, include some data that are consistently reliable, some that are less so. A review of data quality by the Vermont health statistics center, CHIC, revealed that some data items appeared to be more reliably entered, transcribed and tabulated than others. The age and sex of the patient, for example, appears to be highly accurate. Diagnoses, on the other hand, are less reliably recorded than surgical procedures. Each of the various possibilities for error must be evaluated in terms of the use to which the data will be put. For the regulator, concerned with general trends and comparative rates of occurrence, a fair degree of error may be permissible. Gittelsohn summarized the situation as follows:¹²

If one intends to study geographic variations in the incidence of appendectomy or cholecystectomy, a ten percent error rate in the coding of procedure will be insufficient to obscure two or three fold differences in operative procedure rates by community. For peer review purposes, where study is on a case by case basis, the problem of accuracy becomes predominant. Denial of a claim or a judgment of improper treatment based on miscoded data is intolerable.

It should be further noted that use of the data tends to change (and hopefully improve) its preparation, especially when those who use the data had some hand in its preparation. Thus, a hospital administrator or medical record librarian will assign a higher priority to that task in the hospital if the implications of error are of some significance.

Expenditure Data

A number of approaches have been attempted to estimate the flow of dollars in the health care industry, and to calculate population based

expenditure rates. Most commonly, researchers have had to settle for crude numbers through such means as allocating total reported institutional expenditures according to frequency of admission of residents of each community. (An "average cost" for each discharge is multiplied by the number of discharges from a community, and divided by the number of residents to create per capita expenditure rates.) This technique fails to reflect the variability in costs per case, and tends to distort costs from institutions that offer highly specialized services with very high price tags. However, crude estimates of cost differences between communities can be made, as in Table 2 above, and serve to flag gross variations.

Another technique uses disease- or procedure specific cost estimates (such as the California Relative Value Index) and allocates costs to communities for a given medical or surgical reason for admission (as in Table 1, above).

Expenditures reported on claims forms have been used to estimate community costs for services. Published figures on reimbursement under the Medicare and Medicaid programs are aggregated only by county, however, and so do not permit analysis by small areas (town or Zip Code) and hospital service areas. Medicare Part B claims have been used to estimate ambulatory costs for the over 65 population, but this too has obvious limitations. Until national health insurance provides universal claims data, inter-area institutional cost comparisons will be difficult. (The Uniform Hospital Discharge Abstract, as it comes to be used more widely, may offer an acceptable substitute for some areas in the pre-NHI period.)

Rate setters can presumably command the necessary resources to obtain whatever cost data are needed. But much work remains to be done to determine how institutional costs should be calculated on a per-case basis. Until the cost-case-population link is made for each discharge, enabling comparisons between populations, cruder techniques will have to suffice.

Population based estimates of costs have been made in Vermont,

Rhode Island and Maine based on utilization data and price schedules, hospital budget figures and the like. Rhode Island has done a special funds flow study; Vermont researchers have analyzed five months of Medicare Part B claims to estimate the ambulatory part of the cost picture. But until on-going, consistent data are available to link the cost of service to its utilization, this will remain an underdeveloped area for all three data systems. Access to Medicare and Medicaid data on a small area basis, which may evolve under the National Health Planning and Resources Development Act, could go a long way to improve this picture.

Likewise, access to data from Medicare and Medicaid should shed significant light on the other major piece of the puzzle now missing: non-hospital care. Rate setters, like planners and regulators of other parts of the health care system, are now forced to examine information on the use of medical care resources in light that is seriously dimmed: no one has data on the whole system on a statewide basis. Special surveys have been done, and the basic outlines of the picture are pretty clear. But without data on utilization of all medical care services comparable in detail, reliability, and accessibility to hospital utilization information, it will be difficult to perform significant cost-benefit comparisons, or to examine alternative sources of care.

Outcome Data

The murkiest data, the most ambiguous data, and the data that are hardest to come by, are those related to outcome. In the absence of policy and programs to evaluate the results of medical services, regulators are forced to use the rather crude tools of mortality data, and, where it exists, morbidity data. Changes in the quality of life of the medical care recipient are the hardest to measure, and yet the medical care system must be able to continue to meet the needs of people for therapies that improve health as well as prevent death or disability. Much research is needed to develop indicators sensitive to changes in quality of life; in the meantime,

special surveys and studies will be the only measure with which to work.

Randomized clinical trials, which are expensive, technically complicated, and lengthy, remain the best source of data on outcome. These experiments compare the results of different therapies applied to matched populations. The number of reliable clinical trials whose results are widely accepted and agreed upon is woefully small. More research is needed to establish the critical relationship between a particular therapy or technique and its results in terms of reduced pain and suffering or mortality. In the meantime the few existing experimental results should be built into the evaluative armamentarium of all rate setting, planning and policy making agencies in health. With such data in hand, the tasks of such agencies will be far simpler and more productive than can be the case today.

Measures of the Incidence and Prevalence of Disease

Measures of the incidence and prevalence of disease exist for certain problems whose threat to the public health have been recognized, and for which reporting systems and/or effective preventive techniques or therapies have been devised. Thus the incidence and prevalence of diptheria or smallpox can be established in any area of the United States, but the rate at which cancer, diabetes or malnutrition occur in a population can only be estimated or determined by special survey. Indicators such as bed days, days lost from work, or school absentee records are suggestive of morbidity in the population at large, but because they are seldom calculated for small areas and are frequently neither disease specific nor age and sex specific their value is at best limited. Mortality figures from vital statistics offices broken down by residents' age, sex, and cause of death, remain the best overall source of information concerning the population's health.

By now it must be apparent that there are some sticky problems associated with the collection, tabulation, analysis and use of

population based health statistics. For the rate setter unfamiliar with these issues, the problems may seem overwhelming. But it should be remembered that the data have begun to be used in Maine, Vermont and Rhode Island in ways that have direct relevance to the work of rate setting authorities. Crude and incomplete as the tool may be, its utility has been established. Unfamiliar as is the process of incorporating these data into regulatory decision making, it can be done. Although the dangers of drawing unwarranted inferences exist, they can be lessened to a very great extent through cooperative arrangements between regulators, planners and clinicians. The important point is this: the data raise questions that must be addressed in the interests of appropriate costs and better health. To be sure, the question of whether a surgical procedure rate is too high or too low cannot be answered simply. It may require a special study, it will require analysis by surgeons, among others, but it must be asked.

The evidence that utilization rates differ widely between communities cannot be ignored. Rather, the reasons for such differences and measurement of their outcomes in terms of costs, reduction in pain, reduction in morbidity or increased function for people should be rigorously examined, so that explicit choices can be made for more or fewer resources.

IV. USE AND MANAGEMENT OF A POPULATION BASED DATA SYSTEM

Data use and data management are closely linked. Where the data base is located affects its use in many ways, including its access and its credibility. The technological problems associated with merging and manipulating very large data files derived from quite different information systems are sufficiently complex to warrant the development of a single staff.

White, discussing various options for location of health statistics operations, points out that "what does not seem to work is to bury

statistical units within a bureaucracy, in close proximity to the operating elements of that organization."¹³ White points to several reasons for the need for an independent data unit, including objectivity, or credibility, the need for data uniformity (and the power to arbitrate between conflicting data needs), and the need to avoid redundancy, data omission, and excessive cost.

Both Rhode Island and Vermont have incorporated their data bases as free-standing organizational entities established specifically to respond to the needs of many parties for objective, reliable data. Rhode Island's SEARCH is governed by a Board composed of representatives of various interested agencies and groups in the state. In Vermont, the Cooperative Health Information Center has a Board whose majority is composed of public representatives, from outside the health industry. Both organizations function as nonpartisan participants in the health care system in their respective states, "operating on the assumption that data which are collected by appropriate scientific methods and analyzed and interpreted with care will serve the interests of the entire community."¹⁴

In Vermont, the independence of the data base has greatly influenced its credibility with the various parties participating in what must always be an adversary process, the planning and regulation of the health care industry. CHIC's output has been used by the state's Professional Standards Review Organization, the Comprehensive Health Planning Agency, the Health Department, Agency of Human Services, Hospital Association, Medical Society, individual physicians, university based researchers, and others.

The Vermont and Rhode Island arrangements reflect at the state level a similar arrangement at the federal level. The National Center for Health Statistics has served as a statistical resource for health policy and program development and operations for more than a decade. Three years ago, it assumed major responsibility for developing a Federal-State Local Cooperative Health Statistics System (CHSS), and the DHEW's Forward Plan for 1977-81

indicates that support for CHSS will be augmented and extended so that it can provide nationwide the necessary statistical base for all operating health related programs.¹⁵ Both the Rhode Island and Vermont data bases received their initial support from the CHSS, and continue to get part of their financing from that source. However, as the data are used by other federal as well as state and local agencies, financial support for the statistics centers has been broadened to include these agencies.

The National Health Planning and Resources Development Act calls for extensive reliance by its state and regional agencies on a population based data system, and specifically on the Cooperative Health Statistics System. Some day the advent of National Health Insurance will impact directly on state and local level arrangements for data management and control. At this point one can only hope that there will be an effort to protect the credibility and integrity of data programs.

Public health statisticians, epidemiologists and other professionals needed for the operation of large and complex health statistics systems are few and far between. One important reason to set up no more than a single health statistics unit in each state is to be able to attract and get maximum benefit from the scarce manpower resources available.

Where a data base lands in the bureaucracy of health will influence who gains access to the statistics. Because of the newness, complexity and potential of these data, cross-fertilization in use, analyses and interpretation of the statistics should be encouraged. The data are a logical point of contact and cooperation between peer review or quality control groups, planners and rate setters.

Access raises the corollary issue of confidentiality. In the absence of a body of law or experience to govern procedures for release and use of data based on individual patient records, the establishment of a single set of rules in a single agency for the aggregation and use of data seems an appropriate minimum. How far public exposure of the data can go is bound to be hotly debated, as it has been around the PSRO data.

But it is important to remember that population based data files are used as aggregates; profiles are drawn of groups of people, not single individuals. At no time in any of the three existing data centers are individual patient names or numbers part of the processing or tabulation.

The rights of a patient to protection of his or her privacy are clear; the rights of providers to such protection are not so clear. It seems likely that the health care industry is moving toward a time when it will accept the burdens of public accountability, and the discomfort of public scrutiny that goes with it. The penalties for lack of disclosure will be great, both in terms of public trust, and in terms of public funds. Presumably, procedures for data access developed under the National Health Planning and Resources Development Act will recognize at the very least the necessity for free exchange of data between rate setting, peer review and planning agencies. Procedures to protect against unwarranted disclosure and to guarantee redress of grievances are now being developed. Ultimately, the credibility of the health care industry will hinge on full public disclosure of aggregated, reliable data on performance and require that provider data be used by public agencies.

V. CONCLUSION

This paper has examined the potential of a relatively new tool in health care in the United States, population based health statistics systems. It has argued that, with this tool in hand, agencies charged with controlling or regulating the costs of health care can do that job far more effectively. Wide variation in the utilization of services by different populations suggest that reductions in some types of utilization could be achieved without harm and at substantial financial savings to the communities served.

Hospital rate setters cannot by themselves resolve the questions of

which types of utilization rates are too high or too low. However, by examining the data, they can begin to find some of the reasons (such as more surgeons produce more surgery) explaining the variations. They can, most importantly, develop the ammunition to challenge the industry's traditional notion of "need". In the past, rate setters have not been able to refute the "need" for additional hospital resources that hospitals alone define. The measures used to justify those "needs" have been institutional indicators of high volume performance, and these measures were per se limited: they did not describe the population, or even suggest its requirements, nor were differences in volume related to differences in patient outcome, or differences in the health status of populations described. Equipped with population based utilization statistics, rate setters can examine patterns of use over time, compare them to neighboring regions, to state averages, to hospitals of comparable size and complexity, and the like. Eventually they may be able to deal with the issues of productivity in terms of the health status of people rather than the "efficiency" of institutions. They can make cost control a partner to quality control.

How feasible is all this? The answer is that it is highly feasible. In Maine, Vermont and Rhode Island, existing data systems formed the backbone of the data base; other states will be able to use similar resources. By 1981, the Department of Health, Education and Welfare anticipates that all fifty states will have hospital care data comparable to these three New England systems. Vital data and census data are available everywhere. These data sets are enough to start a system; augmented with hospital abstract discharge data, rate-setting cost data, Medicare and Medicaid data, ambulatory and insurance data, special surveys and resource directories the data base can become a true lever for change and a vital aid to understanding the relationship between medical care and health.

There are problems, of course, and some of them have been suggested. This is new territory not only for rate setters, but for statisticians,

public health officials, clinicians and public policy makers. Technological issues, political issues, and bureaucratic issues remain to be resolved. But the early experience is most promising, and there is no particular reason to assume that if these problems can be addressed successfully in three states they cannot be resolved with equal alacrity and success elsewhere.

FOOTNOTES

1. "Unfit Doctors Create Worry in Profession", New York Times, January 26, 1976 and the series that followed through January 30, 1976.
2. Vermont Surgery Study, 1969-71, On the incidence of tonsillectomy and other common types of surgery, Cooperative Health Information Center of Vermont, Inc., Burlington, Vermont, July, 1974, 10-13.
3. Wennberg, John E., et al., "Health Care Delivery in Maine, III: Evaluating the Level of Hospital Performance", The Journal of the Maine Medical Association, 1975, 66,11: 298-306.
4. Rutstein, David D., et al., "Measuring the Quality of Medical Care", New England Journal of Medicine, 1976, 294, 11: 582-588.
5. McCarthy, Eugene G. and Geraldine Widmer, "Effects of Screening By Consultants on Recommended Elective Surgical Procedures," New England Journal of Medicine, 1974, 291,25: 1331-1335.
6. "Incompetant Surgery Is Found Not Isolated", New York Times, January 27, 1976.
7. Lewis, Charles E., "Variations in the Incidence of Surgery", New England Journal of Medicine, 1969, 281:16, 880-884.
8. Wennberg and Gittlesohn, "Small Area Variations in Health Care Delivery", Science, 1973, 182:1102.
9. New York Times, op. cit., January 27, 1976.
10. Vayda, Eugene, et al., "Surgical Rates in the Canadian Provinces, 1968-72, A Five Year Analysis", presented at the 103rd American Public Health Association Meeting, Chicago, November 18, 1975.
11. Vermont Surgery Study, op. cit., p. 13 and Table 9.
12. Notes of Data Quality, Cooperative Health Information Center of Vermont, Inc., Burlington, Vermont, September 1974, 12.
13. White, K.L. and J.L. Murnagham, "Health Care Policy Formation: Analysis, Information and Research", International Journal of Health Services, Winter, 1973, 3:81.
14. SEARCH Reports, January, 1975, 13.
15. Forward Plan for Health, FY 1077-81, U.S. DHEW, PHS, June, 1975, 188-198; see especially p. 198.

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